



Methods of Separation

Separation of Soluble Substances

Evaporation

Evaporation is the best method for separating a mixture (solution) of a soluble solid and a solvent. The process involves heating the solution until the solvent evaporates (turns into gas), leaving behind the solid residue. A common example of this is obtaining salt from seawater. Due to the Sun's heat, seawater evaporates, leaving salt behind.

Example: Separation of Salt from Water

- The solution of salt and water is heated to the boiling point.
- As heating continues, the water evaporates into steam.
- The solid salt remains as a residue after complete evaporation.
- This method is commonly used in salt pans to extract salt from seawater naturally.

Separation of Insoluble Substances

Filtration

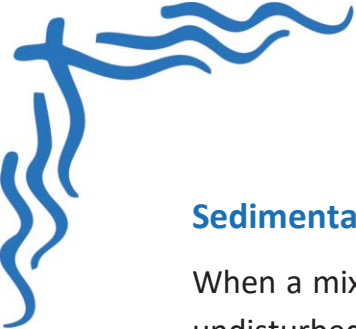
Filtration is used to separate insoluble solids from liquids by passing the mixture through a filter. The process involves a filter paper placed in a funnel, which allows the liquid to pass through while trapping the solid particles.

Example: Separation of Sand from Water

- A mixture of sand and water is poured into a filter funnel lined with filter paper.
- The liquid part (water) drains through the filter paper into the beaker.
- The solid sand particles remain on the filter paper as residue.
- The collected liquid is called the filtrate, and the solid left behind is called the residue.

Applications:

- Used in water treatment plants to filter out solid impurities from river water.
- Used in laboratories to separate precipitates from solutions.



Sedimentation and Decantation

When a mixture of an insoluble substance (such as sand) and water is allowed to stand undisturbed, the heavier particles settle at the bottom due to gravity. This process is known as sedimentation.

After sedimentation, the clean water on top can be carefully poured into another container without disturbing the settled solids. This process is called decantation.

Example: Separation of Sand and Water

- The mixture of sand and water is left undisturbed in a beaker.
- Sand settles at the bottom, forming sediments.
- The upper layer of clean water is carefully poured into another container.

Applications:

- Used in purification of drinking water by allowing mud and heavy particles to settle.
- Used in oil and water separation in industries.

Comparison of Separation Methods

Method	Type of Mixture	Principle Used	Example
Evaporation	Soluble solid in liquid	Heating to remove liquid	Salt from seawater
Filtration	Insoluble solid in liquid	Separation using a filter	Sand from water
Sedimentation	Insoluble solid in liquid	Settling due to gravity	Mud from water
Decantation	Insoluble solid in liquid	Pouring off liquid after settling	Oil from water